REMARKS

Claims 1-13, 15, and 16 are pending in the application and stand rejected. Applicants have canceled Claims 1-16 without prejudice, submitted new Claims 17-26, and respectfully request reconsideration of the above-referenced application.

Objections to the Drawings

FIG. 10 was objected to because it should be designated by a legend such as "prior art." Applicants have submitted herewith a replacement sheet for FIG. 10, which now includes the label "prior art." Since this correction to FIG. 10 alleviates the objection by the Examiner thereto, Applicants respectfully request the Examiner to reconsider the objection to FIG. 10.

The drawings are objected to because the line for item 17 of FIG. 1 does not touch the "substrate to be processed," that rest on 16a. Applicants have submitted herein a replacement sheet for FIG. 1 that now contains an extended line from element 17 touching the substrate to be processed. Applicants respectfully request that the Examiner reconsider that objection based on the submitted replacement for FIG. 1.

The drawings are objected to under 37 C.F.R. § 1.83(a) because a "notch" and an "electric heater" of the deposit shield were not illustrated. Applicants have submitted herein a replacement for FIG. 7 that now shows an electric heater 58 and a notch 57. Applicants have also amended the paragraphs starting on lines 1, 8, and 14 on page 15 of the Specification to now refer to these two elements by their newly assigned indicia. Support for the changes made to FIG. 7 is found in the original

claim language and on page 8 of the Specification. Applicants respectfully request the Examiner to reconsider that objection based on the submitted replacement for FIG. 7.

Rejections Under 35 U.S.C. § 102

Claims 7-9, 15, and 16 are rejected under 35 U.S.C. § 102(e) as being anticipated by Welch et al. (U.S. Patent No. 6,192,827, hereinafter "Welch"). This rejection is now moot in view of the cancellation of Claims 7-9, 15, and 16.

Rejections Under 35 U.S.C. § 103

Claims 1-6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Welch in view of Franklin et al. (U.S. Patent No. 5,965,046, hereinafter "Franklin"). This rejection has been rendered moot in view of the cancellation of Claims 1-6.

Claims 10-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Welch in view of Osaka et al. (Japanese Patent No. 11-037315, hereinafter "Osaka") and Maa (U.S. Patent No. 4,771,805, hereinafter "Maa"). Also, Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Welch in view of Stager et al. (U.S. Patent No. 5,788,799, hereinafter "Stager"). Claims 10, 11, and 12 have been rewritten in independent form and are presented herein as new Claims 19, 22, and 25.

Newly submitted Claims 20 and 21, depending from Claim 19, recite subject matter originally claimed on cancelled Claims 13 and 12, respectively. Newly submitted Claims 23 and 24, depending from Claim 22, recite subject matter

originally claimed on cancelled Claims 13 and 12, respectively. Finally, newly submitted Claim 26 recites subject matter of cancelled Claim 13.

Applicants respectfully submit that Welch, Osaka, Maa, and Steger, individually or in any combination thereof, do not support a *prima facie* case of obviousness of the inventions recited in the newly submitted independent Claims 19, 22, and 25. This is so because, even when combined, these prior are references do not teach or suggest all the claim limitations recited therein.

One of the features of the present invention is a vacuum processing apparatus that provides a uniform plasma deposition process that is simple in structure and which can be made small in size (Specification, page 4, lines 18-25) and more energy efficient (*Id.*, page 11, lines 14-19). In one of the embodiments disclosed, only a shutter opening in a shield in the vacuum processing chamber is moved up and down to provide access to a stage where the substrate being subjected to the plasma deposition process is placed. Uniformity of the plasma is enhanced by maintaining the shield and shutter at the same electric potential by assuring contact between them when the shutter is closed (see, for example, Specification, page 16, line 15 – page 17, line 3). It is the intent of the newly submitted claims to more clearly recite these features of the invention.

As shown in FIGS. 8A and 8B of the above-referenced application, two grooves are provided on an end face of the shutter to be brought into contact with the cutout portion of deposit shield. An O-ring is disposed in the groove on the side of the vacuum process chamber, while a metal spiral ring is disposed in the groove on the side of the process chamber for maintaining the ground potential between the

shield and the shutter. This spiral ring has a spiral shape and has an urging force which defers from a flat annular metal member disclosed in the prior art. This urging force enables the shutter to be brought into tight contact with the end face of deposit shield, thereby maintaining the level of conductivity high and realizing a uniform contact state. Further, the spiral shape absorbs the shock that occurs when the shutter and shield are brought into contact. Furthermore, the O-ring prevents metal particles generated by the spiral ring from spreading into the vacuum process chamber, i.e., into the process area. In addition, the prior art describes a structure in which a movable element is always conductive. However, it is difficult to make such a movable element to be always conductive. Nevertheless, in the instant invention, when the shutter is closed during the plasma deposition process, it is electrically connected to the deposit shield to maintain the ground potential, thereby making uniform the density of the plasma during the plasma process.

Welch relates to the construction of vacuum processing chambers used in the processing of substrates for the position and removal of materials. A particular chamber configuration using a specialized liner is disclosed (Welch, col. 1, lines 6-9). In the outstanding Office Action, The Examiner acknowledges that Welch does not teach several elements of the invention disclosed in the above-referenced application, including: (*i*) a heating mechanism; (*ii*) a shutter with a first groove having an O-ring formed on the stage and a second groove for fitting a spiral seal made of metal; and (*iii*) a deposit shield comprising a heating mechanism and a disk-shaped evacuation plate deposit around a stage.

In addition, Applicants respectfully point out to the Examiner that proper operation of the Welch device requires that "**the door never touches the liner during operation**" (Welch, col. 2, line 50, emphasis added). In fact, "the gaps 88, 90 between the front face 62, 66 of the inner slit passage door 60 and the facing liner upper and lower surfaces 84, 86 are approximately several tens of thousands of an inch" (*Id.*, col. 7, lines 26-29). "[T]he gap is large enough so that the risk of the door touching (rubbing against) the liner during operation is minimized so that the particles are not created, but the gap is tight enough so that plasma is choked and chemical byproducts can not pass through" (*Id.*, col. 7, lines 30-37).

If so, as to the subject matter recited in Claims 19 and 22, Welch does not disclose, among other recited elements, "a conduction groove being configured to receive therein a spiral seal made of metal, said conduction groove formed in the end face of the shutter parallel to and outside of the sealing groove, the spiral seal electrically connecting the deposit shield to the shutter." As to new Claims 25, Welch does not disclose "each of the deposit shield and the shutter is configured to have a grounded potential, the shutter is configured to be . . . abutted on the deposit shield when the plasma processing is conducted."

As to the combination of Welch with the other cited prior art references, Osaka was cited as teaching a gate valve shutter with a groove for feeding an O-ring. The non-analogous art of Maa was cited for teaching a metallic seal for a gate valve; and Steger was cited for disclosing an apparatus having a chamber liner with a heating mechanism.

None of Osaka, Maa, or Steger remedies the defects above-noted with respect to Welch; therefore, Applicants respectfully submit that Welch, Osaka, Maa, and Steger, individually or in any combination thereof, do not support a *prima facie* case of obviousness of the inventions recited in the newly submitted independent Claims 19, 22, and 25. This is so because, even when combined, these prior are references do not teach or suggest all the claim limitations recited therein.

In addition, Welch, Osaka, Maa, and Steger, individually or in any combination thereof, do not support a *prima facie* case of obviousness of the inventions recited in the newly submitted independent Claims 19, 22, and 25 because there is no motivation to combine the references or to modify the reference teachings. It "is improper to combine references where the references teach away from their combination." M.P.E.P. §2145(X)(D)(2) (citing *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983)). Similarly, if a "proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." M.P.E.P. §2143.01 (citing *In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984)). Welch discloses that the door should not touch the liner, i.e., Welch teaches away from having the shutter electrically connected to the shield. Nevertheless, Maa was combined to Welch in order to provide a metallic seal, or contact, between Welch's door and liner, thus rendering Welch unsatisfactory for its intended purpose.

Therefore, Applicants respectfully submit that the combination of Welch, Osaka, Maa, and Steger does not make obvious the invention recited in Claims 19, 22,

and 25. Furthermore, Claims 20 and 21, 23 and 24, and 26 are also not made obvious by Welch, Osaka, Maa, and Steger, among other reasons, because of their dependency from Claims 19, 22, and 25, respectively.

Claim 13 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Welch in view of Hamrah et al. (U.S. Patent No. 5,242,538, hereinafter "Hamrah"). The cancellation of Claim 13 has rendered this rejection moot.

Based on the foregoing discussion, Applicants respectfully request that the Examiner withdraw the rejection of claims 19, 22, and 25 under 35 U.S.C. 103(a) and that claims 19-26 be passed to issuance.

Newly submitted Claims

New independent Claim 17 recites subject matter from the cancelled Claims 15 and 10. New independent Claim 18 recites subject matter originally claimed in the cancelled Claims 15, 16, and 10. Claims 15, and 16 were rejected under 35 U.S.C. §102(e) by Welch. Claim 10, which has been rewritten in independent form as Claim 19, was rejected under 35 U.S.C. §103(a) in view of Welch, Osaka, and Maa.

Applicants respectfully submit that Welch could not anticipate the inventions recited in the newly submitted independent Claims 17 and 18 because Welch does not recite every limitation recited in those two claims. Claims 17 and 18 also recite "a conduction groove being configured to receive therein a spiral seal made of metal, said conduction groove formed in the end face of the shutter parallel to and outside of the sealing groove, the spiral seal electrically connecting the deposit shield to the shutter," which, as noted above, is not disclosed by Welch.

As to the combination of Welch with Osaka, and Maa, none of these cited prior arts remedy Welch's lack of disclosure of a conduction groove having a metal seal; therefore, Applicants respectfully submit that Welch, Osaka, and Maa, individually or in any combination thereof, would not support a *prima facie* case of obviousness of the inventions recited in the newly submitted independent Claims 17 and 18.

Based at least on the foregoing reasons, Applicants believe that this application is in condition for allowance and respectfully solicit an early Notice of Allowability.

Finally, the attention of the Patent Office is directed to the change of address of Applicants' representative, effective January 6, 2003:

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Please direct all future communications to this new address.

Respectfully submitted,

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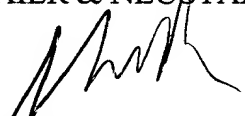

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